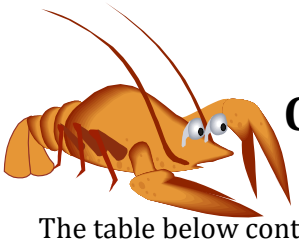

Calculating the crayfish SMR

(a step by step guide)

The table below contains made-up data, to be used as an example for the calculations you will be making:

	Mass (g)	ml standard solution low temp	Conc. O_2 (ml/L)	ml standard solution high temp	Conc. O_2 (ml/L)
Control		4	2.79		
Crayfish 1	5	3	2.09		
Crayfish 2	15	2	1.39		

1-To find the concentration of oxygen in your sample, divide the volume of standard solution used in the titration by 1.43. In this example, we found them to be 2.79 for the control, 2.09 for crayfish 1 and 1.39 for crayfish 2, all at room temperature (or low temperature).

2- This is the concentration of oxygen in each of your samples. To find the actual volume of oxygen present in each jar, we multiply that concentration by the volume of water present in the jar. These jars fit 0.245L of water. However, for the jars that had crayfish in them, we have to take into account the volume of the jar that the crayfish was occupied. We will assume that 1g of crayfish = 1mL of volume. So:

-Volume of control jar = **0.245L**

-Volume of jar with crayfish 1 = 0.245 – 0.005(crayfish mass divided by 1,000 to convert mL to liters) = **0.24L**

-Volume of jar with crayfish 2 = 0.245 – 0.015(crayfish mass divided by 1,000 to convert mL to liters) = **0.23L**

Volume of oxygen present in jar = volume of jar * oxygen concentration. So:

-Volume of oxygen in control jar = 0.245 x 2.79 = **0.68mL**

-Volume of oxygen in jar with crayfish 1 = 0.24 x 2.09 = **0.5mL**

-Volume of oxygen in jar with crayfish 2 = 0.23 x 1.39 = **0.32mL**

3-Now we know how much oxygen was present in the jars before the crayfish was in there (the control jar), and how much oxygen was left after a 30 minute period. By subtracting the volume of oxygen present in the test jars at the end of the tests from the amount present in the control, you will find how much oxygen your crayfish used in a period of 30 minutes. So:

-Volume of oxygen used by crayfish 1 in 30 minutes = 0.68-0.5 = **0.18mL**

-Volume of oxygen used by crayfish 2 in 30 minutes = 0.68-0.32 = **0.37mL**

4-For the SMR, you need to know how much oxygen your crayfish used in one hour. So we multiply the values above by two. Then we divide that value by the crayfish mass, which gives us the value for the SMR in mlO_2/gram/hour.

-SMR of crayfish 1 = (0.18*2)/5 = **0.072 mlO_2/g/h**

- SMR of crayfish 2 = (0.37*2)/15 = **0.049 mlO_2/g/h**

5- Repeat these calculations for the high temperature experiment, and get data from other groups to fill table 8.4 on your worksheet.